UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

STATEMENT OF BASIS FOR ISSUANCE OF UNDERGROUND INJECTION CONTROL (UIC) PERMIT

Permit Number: MI-075-2D-0009

Facility Name: West Bay 22 SWD

West Bay Exploration Company of Traverse City, Michigan, has applied for a United States Environmental Protection Agency (EPA) permit for the West Bay 22 SWD injection well to be used for noncommercial brine disposal in Jackson County, Michigan.

Review of the permit application indicates that no significant environmental impact should result from the proposed injection. The EPA, therefore, intends to issue a permit for this well. Under the authority of Title 40 of the Code of Federal Regulations (40 CFR) Parts 144 and 146, EPA permits must specify conditions for construction, operation, monitoring, reporting, and plugging and abandonment of injection wells so as to prevent the movement of fluids into any Underground Source of Drinking Water (USDW). General provisions for EPA UIC permit requirements are found at 40 CFR Parts 144 and 146, while regulations specific to Michigan injection operations are found at 40 CFR Part 147 Subpart X. In accordance with 40 CFR § 124.7, general information and highlighted permit conditions specific to this well are as follows:

Area of Review (AOR) and Corrective Action: In accordance with 40 CFR §§ 144.55, 146.6 and 146.7, this is the area surrounding the well within which the applicant must research wells which penetrate the injection zone. If any of these wells are improperly sealed, completed or abandoned, and might provide a conduit for fluid migration, the applicant must develop a corrective action plan as shown in Attachment C of the permit to address the deficiency. The applicant has provided documentation on the well population within 1/4 mile of the injection well (i.e., the AOR). There are 3 producing, 0 injection, 0 temporarily abandoned, and 0 plugged and abandoned wells within the 1/4 mile radius AOR which penetrate the injection zone.

Underground Sources of Drinking Water (USDWs): USDWs are defined by the UIC regulations as aquifers or portions thereof which contain less than 10,000 milligrams per liter of total dissolved solids and which are being or could be used as a source of drinking water. The base of the lowermost possible USDW in the vicinity of the injection well has been identified at approximately 226 feet below ground surface. This water-bearing formation is the Marshall Sandstone.

Injection and Confining Zone: Injection for noncommercial brine disposal is limited by the permit to the Niagara Group in the interval between 2662 and 3032 feet below ground surface. This injection zone is separated from the lowermost USDW by approximately 2436 feet of rock strata.

Construction Requirements: The proposed construction of the injection well meets the regulatory criteria of 40 CFR § 146.22. This requires that all new wells which inject fluids which are brought to the surface in connection with oil or natural gas production, or for enhanced recovery of oil or natural gas, be sited so that they inject into a formation which is separated from any USDW by a confining zone free of known open faults or fractures within the AOR. All Class II wells must also be cased and cemented to prevent the movement of fluids into or between USDWs. The permittee shall not commence construction, including drilling, of any new well until a final permit has been issued.

Injection Fluid: The injected fluid is limited by the permit to brine. The expected maximum daily volume of fluid to be injected is 1200 barrels.

Maximum Injection Pressure: The maximum injection pressure shall be limited to 682 pounds per square inch gauge (psig). This limitation will ensure that the pressure during injection does not initiate fractures in the confining zone adjacent to the lowermost USDW during injection operations. This in turn ensures that the injection pressure will not cause the movement of injection or formation fluids into a USDW as prohibited by 40 CFR § 146.23(a)(1).

Monitoring and Reporting Requirements: In accordance with 40 CFR §§ 144.54 and 146.23, the applicant will be responsible for observing and recording injection pressure, flow rate, annulus pressure, and cumulative volume on a weekly basis and reporting this to the EPA on a monthly basis. The applicant will also be responsible for observing, recording and reporting annulus liquid loss on a quarterly basis. An analysis of the injected fluid must be submitted on an annual basis. In addition, the applicant is required to conduct and pass a two-part Mechanical Integrity Test (MIT), in accordance with 40 CFR § 146.8, before authorization to inject is granted, and after the well is completed. The applicant is also required to repeat the annulus pressure test, which is the first part of the MIT, at least once every five (5) years thereafter. If a temperature or noise log or another method as approved by the Director is used to determine the second part of the MIT (i.e., the absence of fluid movement), then the applicant will be required to repeat this test at least once every five (5) years thereafter. These tests will provide EPA with an evaluation of the integrity of the tubular goods (casing, tubing and packer) as well as documentation as to the absence or presence of fluid movement behind the casing.

Plugging and Abandonment: In accordance with 40 CFR §§ 146.10 and 146.24(d), the permit includes a plugging and abandonment plan for an environmentally protective well closure at the time of cessation of operations. West Bay Exploration Company has demonstrated adequate financial responsibilities to close, plug, and abandon this underground injection operation. A state bond in the amount of $25,000 has been established for this purpose with Fidelity and Deposit Company of Maryland.

Issuance and Effective Date of Permit: In accordance with 40 CFR § 124.15, the permit will become effective immediately upon issuance if no public comments were received that requested a change in the draft permit. However, in the event that public comments are received that requested a change in the draft permit then the permit will become effective thirty (30) days after the date of issuance unless the permit is appealed. In accordance with 40 CFR § 144.36(a), the

permit will be in effect for the life of the facility, unless it is otherwise modified, revoked and reissued, or terminated as provided at 40 CFR §§ 144.39, 144.40 and 144.41. The permit will expire in one (1) year if the permittee fails to commence construction, unless a written request for an extension of this one (1) year period has been approved by the Director. The permit will be reviewed by the EPA at least once every five (5) years from its effective date for consistency with new or revised Federal regulations.

Questions, comments and requests for additional information or for a public hearing may be submitted in writing to the contact person listed below or made verbally to Anna Miller at (312) 886-7060 or miller.anna@epa.gov via the internet. The public comment period on this permitting action will close thirty (30) days after the date of the public notice. If the EPA receives written comments indicative of public interest that warrants a hearing on this action, a public notice of a scheduled hearing will be published locally and mailed to interested parties.

To preserve your right to appeal any final permit decision that may be made in this matter under 40 CFR Part 124, you must either participate in the public hearing or send in written comments on the draft permit decision. The first appeal must be made to the Environmental Appeals Board; only after all agency review procedures have been exhausted may you file an action in the appropriate Circuit Court of Appeals for review.

U.S. Environmental Protection Agency
Region 5 (WU-16J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Attn: Lisa Perenchio, Chief
Direct Implementation Section

Lisa Perenchio, Chief
Direct Implementation Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)
UNDERGROUND INJECTION CONTROL PERMIT: CLASS II

Permit Number: MI-075-2D-0009

Facility Name: West Bay 22 SWD

Pursuant to the provisions of the Safe Drinking Water Act, as amended (42 U.S.C. 300f et seq., commonly known as the SDWA) and implementing regulations promulgated by the United States Environmental Protection Agency (EPA) at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (40 CFR),

West Bay Exploration Company of Traverse City, Michigan

is hereby authorized to drill and operate an injection well located in Michigan, Jackson County, T4S, R2E, Section 22, 1/4 Section SW, for injection into the Niagara Group at depths between 2662 and 3032 feet, upon the express condition that the permittee meet the restrictions set forth herein. Injection shall not commence until the operator has received authorization in accordance with Part I(E)(10) of this permit.

The purpose of the injection is limited to noncommercial brine disposal from production wells owned or operated by West Bay Exploration Company.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This permit shall become effective on _____ and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR §§ 144.39, 144.40 and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. The permit will expire in one (1) year if the permittee fails to commence construction, unless a written request for an extension of this one (1) year period has been approved by the Director. The permittee may request an expiration date sooner than the one (1) year period, provided no construction on the well has commenced. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and dated:_____

DRAFT

_____
Tinka G. Hyde
Director, Water Division

PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation pursuant to 40 CFR Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §§ 144.39, 144.40, and 144.41. The filing of a request for a permit modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2 and § 144.5, any information submitted to the EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

(1) The name and address of the permittee; and,

(2) Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all conditions of this permit, except to the extent and for the duration such non-compliance is authorized by an emergency permit pursuant to 40 CFR § 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance or modification.

2. Penalties for Violations of Permit Conditions

Any person who operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition is subject to criminal prosecution.

3. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a permittee in an enforcement action to state that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar

systems only when necessary to achieve compliance with the conditions of the permit.

6. **Duty to Provide Information**

The permittee shall furnish to the Director, within thirty (30) days, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required by this permit to be retained.

7. **Inspection and Entry**

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be retained under the conditions of this permit;

c. Inspect, at reasonable times, any facilities, equipment (including monitoring equipment), practices, or operations, regulated or required under this permit; and

d. Sample or monitor the injected fluids, at reasonable times, for the purposes of assuring permit compliance, or as otherwise authorized by the SDWA, at any location.

8. **Records**

a. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all records required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR §§ 144.31 and 144.51. These periods may be extended by request of the Director at any time by written notice to the permittee.

b. The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan, contained in Part III(B) of this permit. The owner or operator shall continue to retain the records after the three (3) year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

c. Records of monitoring information shall include:

(i) The date, exact place, and the time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) A precise description of both sampling methodology and the handling of samples;

(iv) The date(s) analyses were performed;

(v) The individual(s) who performed the analyses;

(vi) The analytical techniques or methods used; and,

(vii) The results of such analyses.

9. **Notification Requirements**

a. **Planned Changes** - The permittee shall notify and obtain the Director's approval at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Within ten (10) days prior to injection, an analysis of new injection fluids shall be submitted to the Director for approval in accordance with Parts II(B)(2) and II(B)(3) of this permit.

b. **Anticipated Noncompliance** - The permittee shall give at least thirty (30) days advance notice to the Director for his/her approval of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. **Transfer of Permits** - This permit is not transferable to any person except after notice is sent to the Director at least thirty (30) days prior to transfer and the requirements of 40 CFR § 144.38 have been met. The Director may require modification or revocation of the permit to change the name

of the permittee and incorporate such other requirements as may be necessary under the SDWA.

d. **Compliance Schedules** - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than thirty (30) days following each schedule date.

e. **Twenty-Four Hour Reporting**

(i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall include the following information:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or,

(b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

(ii) A written submission shall also be provided as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

f. **Other Noncompliance** - All other instances of noncompliance shall also be reported by the permittee in accordance with Part I(E)(9)(e)(i) and (ii) of this permit.

g. **Other Information** - If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 CFR § 144.51(l)(8).

h. **Report on Permit Review** - Within thirty (30) days of receipt of the final issued permit, the permittee shall report to the Director that the permittee

has read and is personally familiar with all terms and conditions of this permit.

10. **Commencing Injection**

The permittee shall not commence injection into any newly drilled or converted well until:

a. Formation data and injection fluid analysis have been submitted in accordance with Parts II(A)(6) and II(B)(2), respectively;

b. A report on any logs and tests required under Parts II(A)(5) and III(D) of this permit has been submitted.

c. Mechanical integrity of the well has been demonstrated in accordance with Part I(E)(17);

d. Any required corrective action has been performed in accordance with Parts I(E)(16) and III(C); and,

e. Construction is complete and the permittee has submitted to the Permit Writer, by certified mail with return receipt requested, a notice of completion of construction using EPA Form 7520-10 and either:

(i) The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or,

(ii) The permittee has not received, within thirteen (13) days of the date of the Director's receipt of the report required above, notice from the Director of his or her intent to inspect or otherwise review the new injection well, in which case prior inspection or review is waived and the permittee may commence injection.

11. **Signatory Requirements**

All reports or other information requested by the Director shall be signed and certified according to 40 CFR § 144.32.

12. **Notice of Plugging and Abandonment**

The permittee shall notify the Director at least forty-five (45) days before conversion or abandonment of the well.

13. **Plugging and Abandonment**

The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two (2) years thereafter. During the period of non-operation, the well must be tested to ensure that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 CFR § 144.52(a)(6), prior to expiration of the two (2) year period. The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part I(E)(12) of this permit.

14. **Financial Responsibility**

The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 CFR § 144.52(a)(7) as provided in Attachment R of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except when Financial Statement Coverage is used as the financial mechanism, this coverage must be updated on an annual basis.

15. **Insolvency**

a. In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event. Failure to do so will result in the termination of this permit pursuant to 40 CFR § 144.40(a)(1).

b. An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

16. **Corrective Action**

The permittee shall shut in the injection well whenever he/she or the EPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or the EPA determines that the permitted well is not in compliance with 40 CFR § 146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit and the requirements in Part I(E)(10) of this permit have been met.

17. **Mechanical Integrity**

a. The permittee must establish (prior to receiving authorization to inject), and shall maintain mechanical integrity of this well, in accordance with 40 CFR § 146.8.

b. A demonstration of mechanical integrity, in accordance with 40 CFR § 146.8, shall be performed at least every five (5) years from the date of the last approved demonstration. The permittee shall notify the Director of his/her intent to demonstrate mechanical integrity at least thirty (30) days prior to such demonstration.

c. The permittee shall demonstrate the mechanical integrity of the well by pressure testing whenever:

(i) the tubing is removed from the well or replaced;

(ii) the packer is reset; or,

(iii) a loss of mechanical integrity occurs. Operation shall cease whenever one of the aforementioned conditions occurs and not resume until the Director gives approval to recommence injection.

d. The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.

e. The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration.

f. The permittee shall cease injection if a loss of mechanical integrity occurs or is discovered during a test, or a loss of mechanical integrity as defined

by 40 CFR § 146.8 becomes evident during operation. Operations shall not be resumed until the Director gives approval to recommence injection.

g. The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Parts II(B)(3)(d) and I(E)(9)(e) of this permit.

h. The permittee shall report the result of a satisfactory mechanical integrity demonstration as provided in Part II(B)(3)(d) of this permit, except the first such result after Permit issuance, which shall be sent to the Permit Writer.

18. **Restriction on Injected Substances**

The permittee shall be restricted to the injection of fluids brought to the surface in connection with conventional oil or natural gas production or those fluids used in the enhancement of oil and gas production as specified in 40 CFR § 146.5(b). Further, no fluids other than those from sources noted in the administrative record for this permit and approved by the Director shall be injected.

PART II

WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting

Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.

2. Casing and Cementing

Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement to be used in the construction of the well shall be as contained in Attachments L and M of the administrative record corresponding to this permit action which is hereby incorporated by reference as if they appeared fully set forth herein.

3. Tubing and Packer Specifications

Injection shall only take place through tubing with a packer set in the long string casing within or below the nearest cemented and impermeable confining system immediately above the injection zone. Tubing and packer specifications shall be as represented in engineering drawings contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the permittee in accordance with Part I(E)(9)(a) and (b) of this permit.

4. Wellhead Specifications

For every injection well, the operator shall provide a female fitting, with a cutoff valve, to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of the EPA by attaching a gauge having a male fitting.

5. Logs and Tests

Upon approval of the surface casing and cementation records by the Director, any logs and tests noted in Part III of this permit shall be performed, unless already provided. Prior to commencement of injection, the permittee shall submit a

descriptive report prepared by a knowledgeable log analyst interpreting the results of those logs and tests to the Director for approval along with the notice of completion required in Part I(E)(10) of this permit.

6. **Formation Data**

If not already provided, the permittee shall determine or calculate the following information concerning the injection formation and submit it to the Director for review and approval, prior to operation:

a. Formation fluid pressure;

b. Fracture pressure; and,

c. Physical and chemical characteristics of the formation.

7. **Prohibition of Unauthorized Injection**

Any underground injection, except as authorized by permit or rule issued under the UIC program, is prohibited. The construction, including drilling, of any well required to have a permit is prohibited until the permit has been issued.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. **Operating Requirements**

a. Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I(E)(18) and III(A) of this permit.

b. Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between underground sources of drinking water is prohibited.

c. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

d. The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III(A) of this permit.

2. **Monitoring Requirements**

a. Samples and measurements, taken for the purpose of monitoring as required in Part II(B)(3), shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.

b. **Analytical Methods** - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR § 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.

c. **Injection Fluid Analysis** - The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The Director may, by written notice require the permittee to sample and analyze the injected fluid at any time.

d. **Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow Rate and Cumulative Volume** - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly and shall be reported monthly as specified in Part III(A) of this permit. Annulus liquid loss shall be recorded at least quarterly and shall be reported in accordance with the provisions of Part II(B)(3)(b), as the volume of liquid added to the annulus to keep it filled in accordance with Part II(B)(1)(d). All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(e) of this permit.

3. **Reporting Requirements**

Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
Attn: UIC Branch, Direct Implementation (WU-16J)

a. **Monthly Reports** - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 CFR § 144.32. The first report shall be postmarked no later than the 10th day of the month after authorization to inject has been granted. Thereafter, forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate and cumulative volume as required in Parts II(B)(2)(d) and III(A) of this permit.

b. **Quarterly Reports** - Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Parts II(B)(2)(d) and III(A) of this permit. Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.

c. **Annual Reports** - Monitoring results obtained each year shall include the measurements of injected fluid characteristics as required in Part III(A) of this permit. Reports shall be submitted at the end of each anniversary year and shall be postmarked no later than the 10th day of the first month of the following year.

d. **Reports on Well Tests, Workovers, and Plugging and Abandonment** - The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:

(i) Mechanical integrity tests, except tests which the well fails in which case twenty-four (24) hour reporting under Part I(9)(e) is applicable;

(ii) Logging or other test data;

(iii) Well workovers (using EPA Form 7520-12); and

(iv) Plugging and abandonment.

PART III

SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. CORRECTIVE ACTION PLAN (ATTACHED)

OPERATING, MONITORING AND REPORTING REQUIREMENTS

Characteristic	Limitation	Minimum Monitoring Requirements		Minimum Reporting Requirements
		Freq.	Type	Freq
*Injection Pressure	682 psig (maximum)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Chemical Composition of Injection Fluid		annually	grab	annually

SAMPLING LOCATION: The sample location is at the well head

* The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: [{.80 *psi/ft* - (0.433 *psi/ft*)(specific gravity+0.05)} x depth] - 14.7 *psi*. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Niagara Group at 2662 feet was used as the depth and a specific gravity of 1.193 was used for the injected fluid.

** Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

MI-075-2D-0009
Page B-1 of 2

ATTACHMENT Q

OMB No. 2040-0042 Approval Expires 1/31/05

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

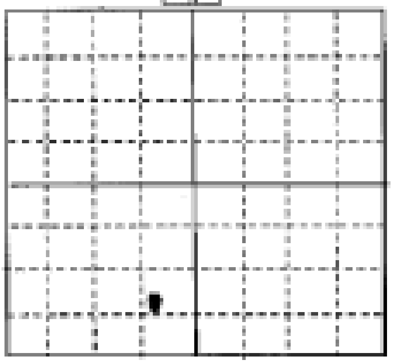
PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
West Bay 22 SWD

Name and Address of Owner/Operator
West Bay Exploration Company
13685 West Bay Shore Drive Suite 200
Traverse City, MI 49684

Locate Well and Outline Unit on Section Plat - 640 Acres

N



State: Michigan
County: Jackson
Permit Number:

Surface Location Description
SW 1/4 of NE 1/4 of SE 1/4 of SW 1/4 of Section 22 Township 4S Range 2E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 665 ft. From (N/S) S Line of Quarter Section
And 1407 ft. From (E/W) W Line of Quarter Section

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name WEST BAY

WELL ACTIVITY
- [ ] Class I
  - [ ] Hazardous
  - [ ] Nonhazardous
- [x] Class II
  - [x] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] Class III

Well Number 22 SWD

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
11-3/4	42	350	350	14-3/4
8-5/8	24	900	900	10-3/4
5-1/2	15.5	2,690	2,680	7-7/8

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [x] Balance Method
- [ ] Dump Bailer Method
- [ ] Two Plug Method
- [x] Other

CEMENT TO PLUG AND ABANDON DATA:	Plug #1	Plug #2	Plug #3	Plug #4	Plug #5	Plug #6	Plug #7
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	7-7/8	5	5	5			
Depth to Bottom of Tubing or Drill Pipe (ft)	2,930	2,630	1,600	392			
Sacks of Cement To Be Used (each plug)	33	30	25	40			
Slurry Volume To Be Pumped (cu. ft.)	38	35	27	47			
Calculated Top of Plug (ft.)	2,830	2350	600	0			
Measured Top of Plug (if tagged ft.)	2,830	2350	600	0			
Slurry Weight (Lb./Gal.)	15.6	15.6	15.6	15.6			
Type of Cement or Other Material (Class III)	CLASS A	CLASS A	CLASS A	CLASS A			

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
2,960'	2,980' OPEN HOLE		

Estimated Cost to Plug Wells

RIG	4815	MISC COSTS	2700
CEMENT	5570	CONTING	1055
RETAINER	3000	TOTAL	21300
SITE COST	3000	SEE ATTACHED WORKSHEET	

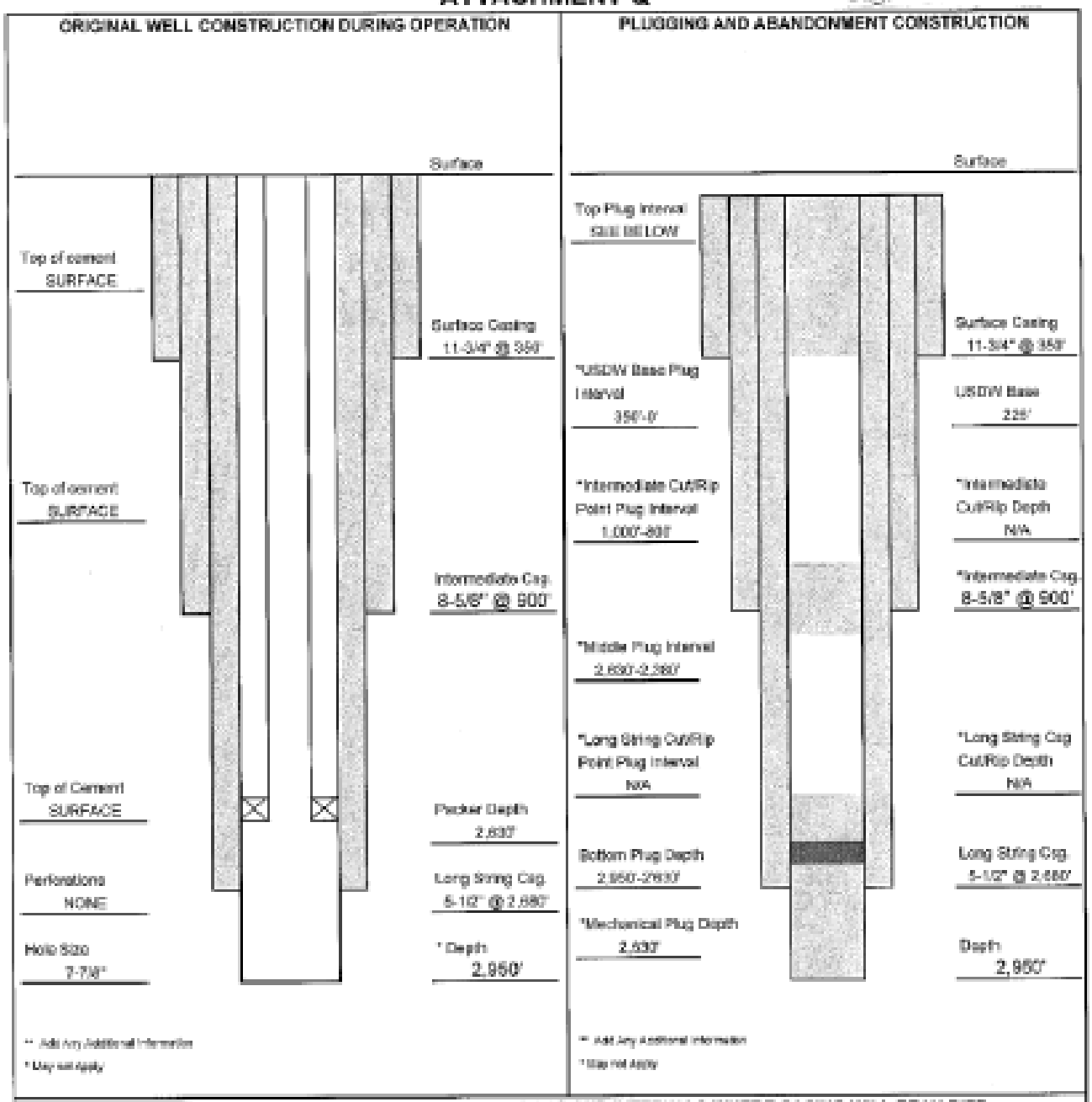
CERTIFICATION

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)	Signature	Date Signed
TIMOTHY J BROCK, AGENT	Timothy J Brock	1/24/2011 12/13/2011

EPA Form 7520-14 (Rev. 8-01)

ATTACHMENT Q



LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED

Specify Open Hole/Perforations/ Varied Casing	From	To	Formation Name
OPEN HOLE	2,680	2,950	NIAGARAN

CORRECTIVE ACTION PLAN

No corrective action is required at this time.

Permit Process Reopened for Underground Injection Well

West Bay Exploration Company

Jackson County, Michigan May 2012

New comment period and public hearing scheduled

The EPA is seeking further comments on the West Bay #22 Well draft permit. The original comment period ended in February and a public hearing was requested. EPA will address all comments received during both comment periods and at the public hearing.

The new comment period closes Friday, June 1.

An information meeting and formal public hearing have been scheduled:

Wednesday, May 23
Information Session:
5:30 to 7:00 p.m.
Public Hearing:
7 to 8:30 p.m.

Columbia Central High School
Brooklyn, Michigan

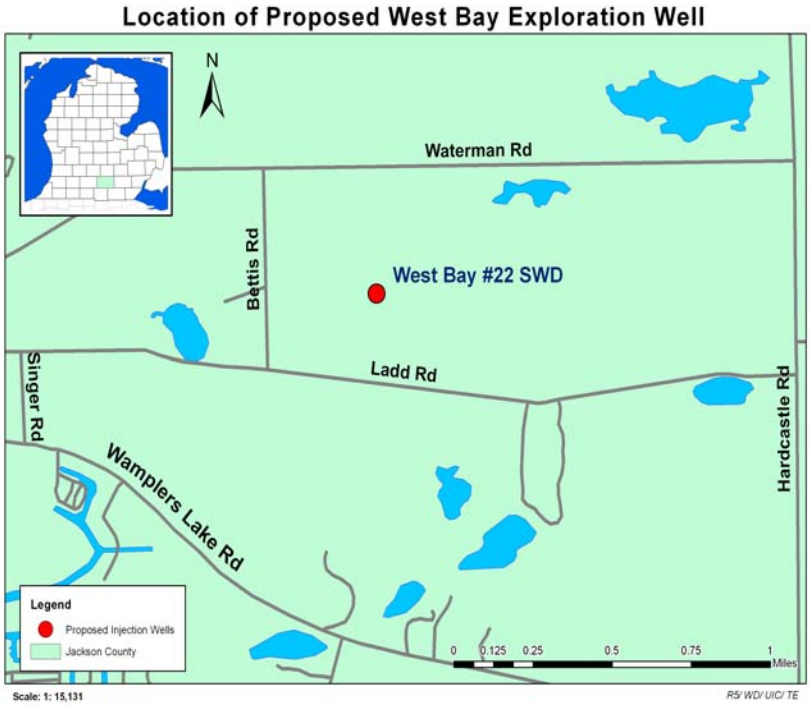
How to comment

If you have submitted a comment, you do not need to resubmit.

Send new written comments to:
Anna Miller
U.S. EPA (WU-16J)
77 W. Jackson Blvd.
Chicago, IL 60604-3590
miller.anna@epa.gov

Right to appeal

You have the right to appeal any final permit decision if you made an official comment in the previous comment period, the new comment period or commented at the public hearing. The first appeal must be made to the Environmental Appeals Board.



This map shows the location of the proposed West Bay #22 draft permit (EPA #MI-075-2D-0009) for an underground injection well.

The U.S. Environmental Protection Agency has scheduled a public hearing on a permit request by the West Bay Exploration Co. The company wants to dispose of brine deep beneath the earth's surface. EPA calls this a Class II non-hazardous brine disposal well.

Class II wells are typically used to inject fluids that result from oil and gas production into the ground. There are about 144,000 Class II wells in the United States. About 20 percent are known to be used for brine disposal.

EPA reviewed the West Bay #22 permit application and found there should be no significant environmental impact from the proposed well. EPA received requests for a public hearing during the original comment period, which closed in February. So EPA will hold a public hearing and begin a new comment period before making a final decision on granting the permit.

The Safe Drinking Water Act authorizes EPA to regulate the underground injection of fluids through wells to protect underground sources of drinking water.

For more information and answers to Frequently Asked Questions for this permit, please check EPA's website at www.epa.gov/region5/water/uic/uicpub.htm.

More information available

You may view the draft permit and public hearing fact sheet at:
Jackson District Library
244 W. Michigan
Jackson, Mich.

You may also view related documents at the EPA's Chicago office. Please contact:
Anna Miller
Permit Writer
312-886-7060
miller.anna@epa.gov.

Or visit www.epa.gov/region5/water/uic/uicpub.htm.

For further questions, call toll-free, 800-621-8431, weekdays, 9:30 a.m. to 5:30 p.m.

Frequently Asked Questions
West Bay #22 Underground Injection Control (UIC) Class II Well

What is a Class II injection well?
Class II wells are typically used to inject into the ground fluids that result from the production of oil and gas. There are about 144,000 Class II wells in the United States. Michigan has about 1,460 Class II wells.

Why did you pick this site? Can't EPA make the company put it somewhere else?
West Bay Exploration Company chose this site. EPA evaluates geological siting, construction and operation for UIC wells. We do not choose locations for a injection wells. We also cannot make West Bay Exploration Company select or use a particular location.

Are there other wells like this one in the area?
There were a few Class II wells in Jackson County. Most have been plugged and abandoned for some time. The West Bay #22 well is the first well proposed in the area for many years.

How many injection wells will there ultimately be?
We don't know. The company may submit additional applications, which EPA will evaluate. EPA cannot limit the number of wells or location of wells. Any limitation on well location or number would come from state regulators. (EPA has received another Class II disposal well application from the company; it is still under review.)

Why is it okay to put the brine underground?
Returning the brine to a confined formation below the lowermost underground source of drinking water through a properly constructed and operated injection well is an environmentally sound procedure. We believe that the injected brine will remain isolated from drinking water.

What's the difference between an aquifer and an 'underground source of drinking water'?
"Aquifer" is a general term for a layer of permeable rock, sand or gravel through which ground water flows. "Underground source of drinking water." or USDW, is a term found in the Safe Drinking Water Act. A USDW is defined as an aquifer or portion of an aquifer that supplies drinking water for human consumption or contains fewer than 10,000 milligrams per liter total dissolved solids. Because of this definition, the regulations often protect aquifers that have the potential to be used as drinking water, even if they aren't currently being used.

How long will disposal go on? How long does the permit last?
Class II wells are permitted for the life of the well or as long as the operator chooses to use the well. The well must meet permit requirements as long as injection goes on or as long as it remains unplugged. The owner must properly plug and abandon the well before being released from the permit. EPA can also terminate a permit for cause.

Do you have any idea how much waste they are planning to dispose of?
We do not know how much waste might be disposed of through this well.

What if they inject brine too fast for it to go into the injection zone? What if the injection zone fills up?
Both of these situations are unlikely. We calculated a maximum injection pressure for this well, which indirectly limits the injection rate. If injected fluid is not permeating into the injection zone, there would be indications in the systems that monitor injection pressure.

We believe the proposed injection zone is capable of receiving large volumes of produced brine. However, if the injection zone were to stop accepting fluid, there would be indications in the systems that monitor injection pressure.

What is the maximum permitted injection pressure?
The maximum injection pressure is 682 pounds per square inch. We calculated this pressure limit to prevent injection from causing fractures in the formation. Our calculation is based on the physical properties of the rock in the injection zone and on the injected brine.

Will the well affect ground water or lakes and streams?
The wastewater will stay deep underground confined between layers of rock and will not reach underground sources of drinking water. EPA reviewed the underground geology of the area before preparing a draft permit. Approximately 2,436 feet of rock strata separates the base of the deepest underground drinking water source from the top of the injection zone. A crystalline layer of rock lies directly on top of the injection zone, forming a confining zone, which should prevent the injected fluid from moving up and out of the injection zone.

Is the ground water in the injection zone a current or potential source of usable water for the community?
The water within the injection zone is not usable as drinking water because it has a high concentration of salts and other constituents.

What is being put in the well?
Only fluids brought to the surface in connection with oil and natural gas production can be put into a Class II well. The company's permit application is to inject brine from oil production. Brine is a general term for fluids brought to the surface during the production of oil and gas. (Brine is sometimes also referred to as salt water, though it contains more constituents than ordinary salt.) Brines are naturally occurring fluids.

What chemicals are in brine?
Common constituents found in brines are: sodium, calcium, magnesium, barium, total iron, chloride, sulfate, carbonate, bicarbonate, sulfide and total dissolved solids. Oilfield brines may contain various amounts of hydrocarbons, such as benzene, ethylbenzene, toluene, xylene, naphthalene and polycyclic aromatic hydrocarbons. These compounds occur naturally in fluids that are separated from the oil and/or gas. Class II injection wells provide a safe means to remove waste from the surface environment and drinking water resources by returning the brine to the rock formations from which they originated or to a deeper rock formation.

Where is the waste coming from?
The company's application to EPA is to inject brines generated by their own production wells only.

Could the company put anything else in its well?
No. The company's permit application is to inject production-related brines, therefore the permit would be restricted to such fluids. The company submitted a fluid analysis to EPA as part of its application, and must do so regularly during operation to demonstrate that it is injecting only fluids allowed by its permit

Is there any other way to dispose of the wastewater?
There are other disposal options, but the regulations do not require companies to consider other options before applying for an injection well permit. We cannot make companies evaluate and compare options, such as discharge to surface water or land application.

Is the well safe?
Class II injection wells provide a safe means to remove waste from the surface environment by isolating it deep underground, away from drinking water resources. The well will be constructed and operated so the injected wastewater will not be able to interact with any known usable water.

Have there been problems with other Class II wells?
Before EPA regulated underground injection wells there were several incidents where injection wells leaked. Since EPA began regulating them, there has not been a documented case of an injection well contaminating an underground source of drinking water.

What are the risks that waste will leak from the well?
There are several safeguards established to prevent the well from contaminating an underground source of drinking water. To prevent leaks, EPA requires well casings to be cemented to the surface. Injection takes place through tubing set within the casing. The space between the casing and the tubing is sealed off and monitored regularly for leaks.

The well must pass a mechanical integrity test to make sure construction is sound before injection can begin. Periodic mechanical integrity tests are required to ensure the well does not have leaks that would allow wastewater to move into an underground source of drinking water. EPA also calculated a maximum injection pressure limit for this well specifically (682 pounds per square inch), based on the physical properties of the geology and of the brine to be disposed. The injection pressure is limited to ensure injection will not cause fractures in the injection zone or confining zone.

Have there been enough studies of the underground geology of the area to permit this well?
Yes, we believe we have enough information on the geology of the area to permit the well. We have data from hundreds of wells that have been permitted by our office, as well as technical studies of the geology of Michigan (such as The Hydrogeologic Atlas of Michigan) which describe the geology of Michigan. In addition, driller's logs or formation records from nearby wells were also used to review geologic data from both the confining zone and injection zone. All the information we have indicates the injection zone is capable of receiving injected brine and that the confining zone will be an effective barrier to fluid movement.

Will they use hydraulic fracturing at this well?
No. Hydraulic fracturing, or fracking, is a technique used in oil or gas production wells. The West Bay #22 well would be an injection well

Will this well cause earthquakes?
It is very unlikely that a seismic event would occur related to this disposal well. The injection zone and type of geology underlying Michigan has been well studied and is not known to be seismically active. Furthermore, the geological zone into which the well would be injecting is not known to have fractures or other faults associated with seismic events.

What about truck traffic and effects from trucks carrying brine?
The state or local governments may regulate transportation-related concerns. EPA's injection well program covers the construction and operation of the disposal well only.

What is EPA's role?
EPA is in charge of implementing the Safe Drinking Water Act. Under that law, EPA has regulations for protecting underground sources of drinking water from contamination by injection wells. EPA's role is to evaluate permit applications and to regulate the construction and operation of the injection well to ensure compliance with the Safe Drinking Water Act. In reviewing the permit application, EPA has determined it can operate safely and does not threaten public health or the environment.

What is EPA's permit process?
The permit process for a UIC permit application is:

- The company submits a permit application to EPA.
- EPA reviews the permit application for completeness.
- EPA may request additional information.
- EPA completes a "technical review" which means we check geological information, well construction plans, well plugging and abandonment plans, and financial assurance for closure, among many other items.
- If there are any concerns about the technical information, EPA will request more information or notify the company of changes that must be made to correct the concerns.
- EPA makes a preliminary decision on application approval, and drafts a permit if there are no reasons for denial.
- EPA places the draft permit decision on public notice, allowing 30 days for comments.
- EPA may hold a public hearing.
- EPA will collect and evaluate comments and respond to all commenters.
- EPA will make a final decision on whether or not to issue a permit.

What is Michigan Department of Environmental Quality's role?
MDEQ's role regarding injection wells is similar to EPA except that MDEQ implements state law. In addition, MDEQ is responsible for the surface facility that will be associated with the injection well.

I still don't want it. What can I do?
Any person who filed comments on the draft permit or participated in the public hearing may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing) to the extent required by these regulations. The *petition should, when appropriate, show that the permit condition(s) being appealed are based* upon either a finding of fact or conclusion of law which is clearly erroneous, or an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.

If you wish to request an administrative review, you must submit such a request by mail to U.S. Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Ave., N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to U.S. Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building, 1341 G St., N.W., Suite 600, Washington, D.C. 20005

United States
Environmental Protection
Agency, Region 5
Water Division

77 West Jackson Boulevard
Chicago, Illinois 60604-3590
Mail Code WU-16J
Underground Injection Control Branch

January 20, 2012

PUBLIC NOTICE

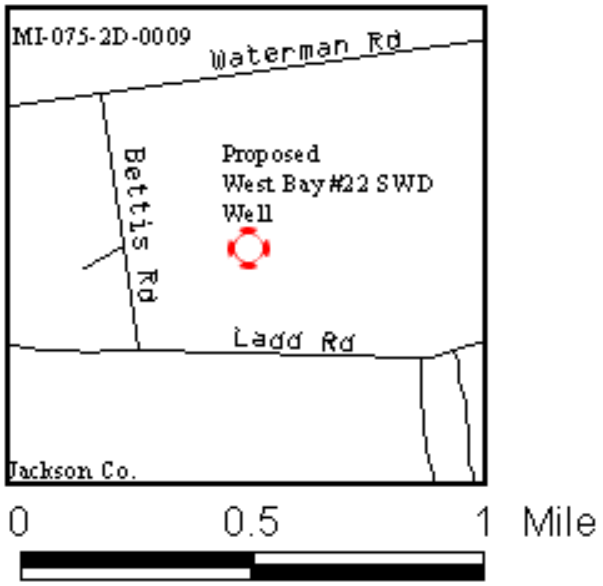
The United States Environmental Protection Agency (EPA), Region 5 office, plans to issue an injection well permit. This is your chance to send written comments on this proposed Class II injection well permit.

The Safe Drinking Water Act requires us to regulate underground injection of fluids through wells to protect the quality of underground sources of drinking water. This is done in part by issuing permits to owners/operators of underground injection wells. The regulations governing underground injection wells are at Title 40 of the Code of Federal Regulations (40 C.F.R.) Parts 144 and 146. The procedure for the permit process is at 40 C.F.R. §124.5. More information about our program is on the Internet at: http://www.epa.gov/r5water/uic

FACTS

West Bay Exploration Company of Traverse City, Michigan will own and operate one proposed injection well for noncommercial brine disposal. West Bay Exploration Company will inject brine into a rock formation 2662 feet below the ground surface. West Bay Exploration Company has also applied for a permit for the well from the Michigan Department of Environmental Quality (MDEQ).

LOCATION: Jackson County, Michigan
NE 1/4, SE 1/4, SW 1/4, Section 22, T4S, R2E (See Map)
EPA Draft Permit: # MI-075-2D-0009
WELL NAME: West Bay 22 SWD
MDEQ PERMIT: 60366
Permit Writer: Anna Miller, (312) 886-7060, or miller.anna@epa.gov via the internet.



You may see the draft permit at: Jackson District Library, Carnegie Branch, 244 West Michigan, Jackson, Michigan; Monday-Thursday 9 a.m. to 9 p.m. and Friday 9 a.m. to 6 p.m., Saturday 10 a.m. to 5 p.m. The draft permit is also on the Internet at: http://www.epa.gov/r5water/uic

Send your written comments to the Permit Writer at the Internet address listed above, or to this address:

U.S. Environmental Protection Agency
DI Section (Attn: Lisa Perenchio)
77 West Jackson Boulevard, (WU-16J)
Chicago, Illinois 60604-3590

We must receive your comments by close of business on the 30th day after the date at the top of this notice. However, be aware that the EPA does not have the authority to change the surface location of the injection well. Any issues regarding surface facilities, such as the location of the proposed injection well should be addressed to the MDEQ. MDEQ can be contacted at the following address: P.O. Box 30256, Lansing, Michigan 48909-7756 and phone number (517) 241-1515. During the public comment period, you may request a public hearing in writing. You must state the issues you propose to raise at the hearing. If we receive many comments on this draft permit decision, we will hold a hearing, and publish a notice of the hearing at least 30 days before the hearing. If there is a hearing, you may make your comments then. We will consider all comments received and then issue a final permit decision.

If you wish to visit the Region 5 office, please call the Permit Writer first. The office is at the address listed above, and is open between the hours of 9 a.m. and 4 p.m. You may view the administrative record, including all data submitted by West Bay Exploration Company, at the Region 5 office.